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# **Student Course In Railroading**

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**By FRED G. ATHEARN**  
**Manager of the Bureau of Economics of the**  
**Southern Pacific Company**

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FRED G. ATHEARN

## INTRODUCTION.

This outline of work and reading in railroading is not designed to be a complete and exhaustive study of the subject. Its aim is to be a "laboratory" course, as it were, to fit young men to assume positions of responsibility in the management of railroad affairs, and to prepare them in such a way that they may have a working knowledge of the several departments and their inter-relation, so that they may be able to conduct the particular duties assigned to them in harmony with the scheme of railroading as a whole.

For constructive criticism, I am indebted to Mr. William Sproule, President; Mr. E. E. Calvin, Vice-President in charge of Operation and Construction; Mr. A. D. McDonald, Auditor; Mr. E. O. McCormick, Vice-President in charge of Traffic; Mr. W. R. Scott, General Manager; Mr. G. F. Richardson, Superintendent of Transportation; Mr. J. M. Davis, General Superintendent; Mr. J. M. Brewer, Freight Claim Agent; Mr. Thomas A. Graham, General Freight Agent; Mr. W. F. Taylor, Assistant General Freight Agent; Mr. W. C. Dorsey, Chief Clerk, Auditor of Disbursements; Mr. Norman Collyer, of the President's office; and Mr. L. A. Giamboni, Assistant in the Bureau of Economics; all of the Southern Pacific Company; Mr. Paul Shoup, President, Pacific Electric; and Major Charles Hine, Vice-President and General Manager, Southern Pacific of Mexico.

F. G. A.

*San Francisco, December, 1912.*





### **DESIGN OF COURSE IN RAILROADING.**

The course is so designed that the first two years will cover the entire field of railroading in a general way. The work of the railroad is divided into three main groups, Operation and Maintenance, Passenger and Freight Traffic, and Accounting.

After the completion of the first two years, there follows one and one-half years of special work in each of the several main divisions.

This plan has the merit that it gives a general training in all of the principal departments of the railroad. This gives the student the knowledge that is so necessary to conduct properly the work of any given department in which he may later specialize in harmony and in co-ordination with all the other departments of the road.

At the end of the first two years of the course, the student is assigned to special work, for one and one-half years in one of the three main divisions. The particular division to which he is assigned depends upon the student's own inclinations, coupled with his qualifications as determined by his record and the observations of the Officer in Charge of Students.



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# GENERAL COURSE.

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## STUDENT IN STATION SERVICE.

*First Period — Six Months.*

### A.

1. Receiving, trucking, marking and preparing freight for loading and unloading.
2. Loading and storing freight in cars; juxtaposition of different commodities.
3. Station order loading.
4. Handling of explosives.
5. Transferring of freight.
6. Checking of errors in loading and unloading.
7. Different systems of handling freight.
8. Cost of handling freight per ton, and how effected.
9. Handling and checking baggage.

### B.

1. Placing cars for loading and unloading; importance of proper arrangement.
2. Carloads and less than carload lots, with special attention to loading cars to maximum capacity and the assigning of cars in commercial switching of such capacity as to fit as nearly as possible the shipment offered.
3. Over and short shipments; how best avoided.
4. Sealing and seal records.
5. Routing, particularly of foreign cars.

6. Demurrage charges; laws governing. State and Interstate Commerce Commission rules.

**c.**

1. Accounts and statistics. Make careful study of all forms and reports and why used.

2. Classification of freight and tariffs. Note the difference between the Western and the Official classification. These classifications should be studied with the view of learning not only how to find and apply rates but as well the general principles underlying the classification of commodities.

3. Filing of correspondence. Give special attention to the Williams Decimal System, edition of 1910.

4. Systematic and convenient filing of freight and passenger tariffs. It is important that tariffs be so filed that information concerning rates may be quickly and accurately ascertained, not only for your own convenience but also for the accommodation of customers.

5. Bill of Lading, Shipping Receipt, and Waybill.\*

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\* A BILL OF LADING is the carrier's receipt to the shipper for freight to be transported. The Interstate Commerce Commission has set forth the terms and conditions thereof on domestic shipments. The bill when signed by shipper and carrier constitutes a written contract.

Two forms are in common use:

First: "Straight Bill of Lading" (not negotiable), under which the shipper consigns the property straight to the consignee, the title to the goods being thus vested in the consignee. In most States, the carrier is permitted to deliver such shipments directly to that consignee (if known) without surrender of the bill of lading, or to any other party upon order of that consignee without production of the bill of lading. When the consignee is not known to the agent, the straight bill of lading is usually required as identification.

Second: "Order Bill of Lading" (negotiable), under which the shipper consigns property to his own order with instructions to the carrier to notify some other party (usually his customer) upon the arrival of the goods. The customary procedure is for the shipper to draw a draft upon the "notify" party, or customer, attaching the "order" bill of lading (duly

6. Car Records.
7. Loss and damage claims, and Over and Short claims; causes and remedies.
8. Per diem service rules.
9. Mail service.
10. Handling of train orders. (A general knowledge is all that is required at this time. Standard rules 201 to 223, inclusive, also 250 to 256, inclusive.)
11. Ticket sales, and cashier's work.
12. Baggage records.
13. Soliciting business and representing Company.
14. Study of advertising methods.

#### **ALLOTMENT OF TIME.**

To subdivisions A and B, 3 months.

To subdivision C, 3 months.

(The work of this entire period will be done at a medium sized station.)

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endorsed by the shipper), and to transmit these documents through the shipper's bank to a bank at destination. The "notify" party is obliged to pay the draft to secure the bill of lading. The agent at destination is not permitted to make delivery without surrender of the "order" bill of lading, duly endorsed by the shipper. After such endorsement, the title to the property is vested in the holder of the "order" bill of lading. (See Accounting Department Rules 47 to 55, inclusive.)

A SHIPPING RECEIPT is a document somewhat similar to a bill of lading. It is being rapidly superseded by the uniform bill of lading, promulgated by the Interstate Commerce Commission. Usually, it bears no terms or conditions, but carries a notation that the shipment is tendered subject to the terms and conditions of the carrier's standard bill of lading, and is often exchanged at the commercial office of some interested carrier for a standard bill of lading.

A WAYBILL is the carrier's official record of freight in transit. It usually moves in the custody of the conductor along with the freight. It constitutes the shipping agent's advice to the agent at destination (or to an agent at some intermediate junction) of the shipper, consignee, marks, commodity, quantity, rate, and charges, indicating whether the charges have been prepaid or are to be collected, etc. From this waybill, is prepared the freight bill against the consignee for the charges due. After the waybill has served the purpose of the agent at destination, it is sent for filing to the proper official of the Accounting Department.

**SPECIAL NOTES.**

1. Students must furnish satisfactory indemnity bond during time allotted to subdivision C. The premium on this bond will be paid by the Company.

2. During this period, too much emphasis cannot be placed on accuracy of statement and courtesy in your dealings with the public. Bear in mind that you are a salesman, and that the success of your Company depends very largely upon how you treat its customers. The public is not so well informed on railroading as you are, and apparently foolish questions are nevertheless honest. Give all the information and help you can.

3. Whenever it is possible to do so, put your dealing with a customer on a personal basis. Tell him your name and ask his; then in your subsequent conversation with him call him by name, and *pronounce the name correctly*. In correspondence, be sure to spell name of customer correctly, with correct initials and business title, if he has one.

4. Time is the essence of railroading. Have your switch lists ready for local crews doing way work. Salaries and fuel consume money very rapidly; and ten or fifteen minutes delay involves a great loss to the Company.

**READING.**

Railroad Organization and Working. Dewsnup. Pages 63-75, 113-126, 127-146, 433-440, 440-446, 447-458, 463-487.



American Railway Transportation. Johnson. Read the entire book, giving special attention to Chapters 9, 10, 12 and 19.

Railway Mail Service. Tunell.

Mail Carrying Railways Underpaid. Statement by the Committee on Railway Mail Pay, October, 1912. (Obtainable at Headquarters of Union Pacific or Southern Pacific.)

Baggage Rules, rules governing safe transportation of explosives.

Transportation Rules 916 to 953, inclusive; and 980.

Make a careful study of Official and Public Time Table; Official Guide and Routes.

Railroad Traffic and Rates. Johnson and Huebner. Vol. I, Chapters 6, 7 and 11. Vol. II, Chapters 28 to 33, inclusive; Chapters 44 to 46, inclusive.

Railway Station Service. Burt.

Freight Terminals and Trains. Droege. Chapters 2 and 9.

Economics of Railway Operation. Byers. Pages 513-536 and 194-209.

Code of Car Service Rules and Per Diem Rules of the American Railway Association.

Accounting Department Instructions to Station Agents. (Reference only.)

Instructions and Information U. S. Mail and R. R. Business Mail.

**ASSISTANT SECTION FOREMAN—STUDENT IN  
MAINTENANCE OF WAY SERVICE.**

*Second Period — Three Months.*

1. Roadbed, width and slope of cuts and fills, sub-grade, ditches; method of forming embankments, culverts, drainage, destruction of weeds, fencing. (Special attention should be given to subject of drainage.)

2. Ballast, purpose, requirements; kinds of ballast and relative desirability and costs; methods of laying, cost per cubic yard and how affected.

3. Surfacing, purpose; super-elevation of curves; importance of not raising general level of track in ordinary surfacing; causes of center-binding and springy track; how avoided.

4. Ties, kinds of timber; relative cost and durability, treated and untreated; regulations and methods of laying.

5. Tie-renewals; importance of this item and best method of determining per cent. of renewals; cost.

6. Rails, weight used and how determined; rail wear, on curves, on tangents; creeping; rail-renewal, most effective organization of gang for this work; use of discarded rail; use of rail removed from main line for side tracks; transferring inner and outer rail on curves.

7. Joints and joint fastenings; relative merits of square and broken and of supported and suspended joints; theoretical requirements for a perfect joint; causes of rail joint troubles; tamping of joints.

8. Switches, split switch, stub switch, facing point switch, elements of safety and danger in each; derailing

switch and its uses; rules for laying switches. Frogs; give careful attention to the various designs for frogs, such as the spring-rail and rigid frog, and proper angle to use.

9. Tie-plates, advantages and different designs; merits and cost of each.

10. Track implements, proper care, repair and record of same.

11. Buildings, bridges, track on bridges, trestles.

12. Wrecking and emergency work, protection of trains, patrolling of dangerous track, assembling material, organization of gangs, reports and records.

#### **SPECIAL NOTES.**

1. As the work of the station represents the operation of the railroad in miniature, so the work of the section represents the work of the Maintenance of Way Department. The section is the maintenance of way unit.

2. Tie-renewals. This item is one of the most expensive in maintenance work. It will be found that section foremen, where the matter is left to their judgment, vary widely in the renewals made, even where the conditions obtaining are practically the same. A definite and well-carried out system should be pursued in the matter of indicating when and what ties should be renewed, and should not be left to the judgment of individual foremen.

3. Very diligent study should be given to the methods employed during emergencies, such as washouts, slides,

wrecks, etc. Above all things preserve discipline and organization. Do not give orders till you know the facts, and the best way to get facts is to get on to the ground, if possible, and learn them.

**READING.**

Economics of Railway Operation. Byers. Chapter 2, Part 5.

Elements of Railroad Engineering. Raymond. Chapters 1 to 9, inclusive.

Railroad Construction. Webb. Chapters 1 to 12, inclusive.

Railway Organization and Working. Dewsnap. Pages 160-174.

Notes on Track. Camp. (Reference only.)

Manual of Recommended Practice, for Railway Engineering and Maintenance of Way.

Economics of Railroad Construction. Webb.

Rules and Instructions. Maintenance of Way Department.

Freight Terminals and Trains. Droege. Chapter 4.

Rules and Regulations for the Maintenance of Way and Structures.

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**STUDENT IN OFFICE OF SUPERINTENDENT OF  
TRANSPORTATION.***Third Period — Three Months.***A.**

1. Rules and laws governing the ordering and placing of cars, demurrage, etc.
2. Methods of ascertaining the available equipment on divisions.
3. Prevention of unnecessary empty-car mileage.
4. Rules and laws governing allotment of cars during period of car shortage, with special attention to cars for interstate traffic.

**B.**

1. Anticipating future demands for cars by study of car prospects, market conditions, and prices of commodities.
2. Expediting return of home cars from foreign lines.
3. Assignment of foreign cars to the best advantage in order to minimize per diem charges and to comply with Car Service rules.
4. Work of Car Record Office. Advantages and disadvantages of loose-leaf ledger and card index systems.
5. Conductor's Train and Tonnage report.
6. Interchange report.
7. Junction report.
8. Per diem report.
9. Importance of balance between time and tonnage.

10. Handling of revenue and official special trains and private cars.

11. Code of Per Diem Rules, American Railway Association's Code of Car Service Rules, and Master Car Builder's Association Code of Rules governing interchange and use of foreign cars and repair of same.

12. Relations with foreign roads, charges for equipment and renewals.

13. Systems of dispatching; Fast Freight and otherwise ("Manifest," "Time," "Preference," "Fast," "Red Ball," and "Green Ball" freight systems).

14. Handling of refrigerator cars.

15. Car tracing; necessity for and abuses of.

#### **ALLOTMENT OF TIME.**

To Subdivision A, 1 month.

To Subdivision B, 2 months.

#### **SPECIAL NOTES.**

1. The functions of the Office of Superintendent of Transportation have, as a rule, been underestimated. It is safe to assert that even those who are a part of that organization have only dimly appreciated the vital part they are destined to play in the economical operation of a railroad.

The Office of the Superintendent of Transportation stands in a dual relation. It forms the link between Operating and Traffic departments. On the one hand it performs a purely operating function in the handling of cars; on the other hand, it performs a strictly traffic

function in its relation to the shipper in the allotment of cars, diverting, tracing, and keeping shippers informed generally as to the whereabouts of merchandise in transit.

The importance of these last named duties is of the very greatest. Prompt and accurate information concerning shipments is, in the majority of cases, the shipper's measure of efficient service.

2. The most important function of this office is to forecast "commodity" movements sufficiently far in advance to make sure that the equipment necessary to handle a given movement of freight is assembled at the point at which it is needed.

3. Special attention should be given to the method of distributing cars during a period of car shortage.

4. Nothing is of more value to the Company, nothing will do more to hold trade, than to give patrons prompt and accurate information as to the location of goods in transit. This information is usually asked for over the telephone. It is over the telephone that one's voice is most likely to show impatience and irritation, and the temptation is strong to give curt answers. The telephone has lost more friends than anything else. Take special pains to be pleasant and courteous when talking over the telephone.

#### **READING.**

Railroad Traffic and Rates. Johnson and Huebner. Vol. I, Chapters 8 to 14, inclusive.

Railway Organization and Working. Dewsnap. Pages 63 to 75, 80 to 112 and 440 to 488.

The Pooling of Freight Cars. J. R. Cavanagh. *Annals of American Academy of Political and Social Science*; March, 1907; Vol. 29, Page 260.

Progress Towards Car Efficiency. A. Hale. *Railway Age Gazette*; September 25, 1908; Vol. 45, Page 999.

Freight Terminals and Trains. Droege. Chapters 11, 15 and 21.



**STUDENT UNDER MASTER MECHANIC.***Fourth Period — Three Months.***A.**

1. Preparation and care of passenger cars.
2. Preparation and care of freight cars.
3. Car inspection; importance from standpoint of economy and safety, and with special attention to the relation of inspection to cost of repairs.
4. Rough handling and how best prevented.
5. Classification and construction of freight cars.

**B.**

1. Engines; types and how classified.
2. Difference in design of various types of engines.
3. Purpose of different designs.
4. Repairs; principal item in cost of repairs, cost per engine-mile.
5. Total cost of operating an engine per engine-mile. Elements which go to make up this cost and how affected.
6. Flange lubrication and results derived.
7. Fuel; elements which determine the value of any given fuel; comparison of coal and oil.
8. Proper and improper use of fuel in firing and effect upon cost of repairs per engine-mile.
9. Methods of storing fuel and accounting for same.
10. Water; importance of good water. What constitutes good water.
11. Effect of poor water on operation and repairs.
12. Methods of treating and economic results.

**ALLOTMENT OF TIME.**

To subdivision A, 1 month in Car Cleaning Yards.

To subdivision B, 2 months; one month in shops and roundhouse, and one month with Road Foreman of Engines.

**SPECIAL NOTES.**

1. The student should obtain a fair working knowledge of elementary machine design, so as to enable him to read drawings of machinery without difficulty.

2. The largest expenditure made for a single item by a railroad is for fuel. The importance of economy in its use is, therefore, *prima facie*. In this connection engine mileage and engine loading become of paramount importance. It has been aptly said that successful railroading depends upon two things: First, loading cars; second, loading engines.

**READING.**

Any standard work on Steam Engines.

Elements of Railroad Engineering. Raymond. Chapters 11, 12 and 13.

Economics of Railroad Operation. Byers. Chapter 3, Part 5, and Pages 492-513.

Railway Organization and Working. Dewsnup. Pages 212-243.

Economics of Railroad Construction. Webb. Chapter 7.

Railroad Construction. Webb. Chapters 15 and 16.

Railway Age Gazette, January 15, 1909. Page 119.

Official Proceedings of Pittsburg Railway Club, January, 1908. Page 94.

Rules and Regulations governing air brakes, air signals, heating and lighting passenger cars, electric and acetylene headlights.

**STUDENT BRAKEMAN AND CONDUCTOR.***Fifth Period — Three Months.***A.**

1. Train signals.
2. Protection of trains.
3. Coupling and uncoupling, with attention to prevention of personal injuries.
4. Switching, with attention to prevention of personal injuries.
5. Handling cars; importance of careful handling.
6. Advantageous placing of cars in train.

**B.**

1. Yard, way freight, through freight and passenger train work.
2. Handling of bills on freight trains and of transportation on passenger trains.
3. Conductor's records and reports.
4. Handling of train orders (to be studied also from conductor's point of view).
5. Action in case of accidents.

(Student must pass a satisfactory examination on Train Rules, given by the regularly authorized examiner, before he will be allowed credit for this period. The certificate of examination must be forwarded to the officer in charge of students.)

**ALLOTMENT OF TIME.**

To subdivision A, 1 month, as extra brakeman with freight crew; 1 month in yard work.

To subdivision B, 1 month; 2 weeks as assistant to conductor with freight crew, 2 weeks as extra brakeman with passenger crew.

**SPECIAL NOTES.**

1. Promptness and certainty in train movement is the essence of successful operation. Make every move count. One of the prime requisites for a successful railroad official is the ability to recognize when trains are properly and improperly handled.

2. "Safety First" should govern every act of a trainman. There is no class of employes of a railroad in a better position to promote safety than trainmen. Everything pertaining to the operation of trains should be made secondary to the safety of life and property. When in doubt, take the safe course.

**READING.**

Transportation Rules.

Current Time Table.

Economics of Railroad Construction. Webb. Chapters 5, 10, 11 and 12.

Economics of Railway Operation. Byers. Chapter 4, Part 5.

Railway Organization and Working. Dewsnap. Pages 243-263.

American Railway Transportation. Johnson. Chapters 9 and 10.

Accounting Department Instructions to Conductors.  
(Reference only.)

**STUDENT IN ACCOUNTING DEPARTMENT—  
STATISTICAL BUREAU.**

*Sixth Period — Three Months.*

1. Statement of gross and net tons hauled in freight and mixed trains.
2. Locomotive performance in freight service.
3. Statistics of freight train service.
4. Statistics of passenger train service.
5. Operating statistics by divisions.
6. Operation of important freight stations.
7. Statistics of Maintenance of Way and Structures.
8. Statement of revenues and expenses.
9. Statement of freight earnings.
10. Statement of passenger earnings.
11. Effect on freight earnings by reason of diversions.
12. Distribution of commodities by tonnage interchange.
13. Freight interchanged with other lines.
14. Statement of estimated freight earnings.
15. Statement of business routed adversely.
16. Comparative statement of business done at agencies.

**SPECIAL NOTES.**

1. It is intended that the student shall learn the sources from which are obtained the figures used to make up the statements listed above and how they are compiled.
2. The chief value of statements rendered to officials lies not in their forming a condensed compendium to

which reference may be had to ascertain the total expenditures and receipts governing any given item but in affording a panoramic view of the entire situation.

That with which one is in immediate contact is likely to assume undue proportions at the expense of other things that are of vital importance.

3. Thousands of dollars are being spent in making out statements, and the money is worse than wasted unless the statements are concise, and can be used immediately. There is nothing more worthless than a statistical statement which cannot be digested quickly.

4. The failure of many a good man is directly traceable to the fact that either through indifference, or lack of ability to do so, he did not properly analyze and interpret statements from the Accounting department.

5. There is a prevalent notion that the examination of operations through the medium of statistics will serve as a corrective of errors already committed. Post mortems never cured anything. The most illuminating thing in business is the light of experience, but it doesn't pay to waste that light looking for something that has passed into history and when found can add nothing of constructive value to the business.

In the railroad business there is a tendency for officials to burden those under them with requests for statistical *histories* of things that have happened, when what is needed is a quick and immediate application of an improvement for the future.

Statistics should be prepared to establish general policies for future action, and they should not be abused

by using them as a substitute for diligent and aggressive supervision. Calling for statistics and explanations, in supervision work, is substituting the process for the thing.

Finally, percentages, except for large numbers, mean nothing. Stale statistics are dangerous. A railroad cannot be run from an accountant's cloister.

#### **READING.**

Railway Organization and Working. Dewsnap. Pages 264 to 384.

Railroad Traffic and Rates. Johnson and Huebner. Vol. I, Chapter 7; Vol. II, Chapter 28.

Letters from an Old Railroad Official to His Son. Second Series. Hine. Letters 13, 20 and 21.

Modern Organization. Hine. Chapters 4 and 5.

How to Analyze Railroad Reports. Moody.

**STUDENT IN TARIFF BUREAU.***Seventh Period — Three Months.***A.**

1. Compilation of freight tariffs.
2. Division of rates between "local" and "through."
3. Freight tariff agreements; basis of division between lines.

**B.**

1. Compilation of passenger tariffs.
2. Division of rates between "local" and "through."
3. Passenger tariff agreements; basis of division between lines.

**C.**

1. Freight rate information bureau, waiting on the public.

**ALLOTMENT OF TIME.**

To subdivision A and B, 2 months.

To subdivision C, 1 month.

**SPECIAL NOTE.**

An alert rate clerk can pick up a great deal of business. Whenever possible, put the dispensing of information on a personal basis. Don't let an inquirer go away without learning his name, if possible, and when he intends to ship, and, if at all feasible, get a routing order from him. Turn this data over to a solicitor at once.

**READING.**

Railroad Traffic and Rates. Johnson and Huebner. Vol. I, Chapters 15 to 25, inclusive.

The Working of the Railroads. McPherson. Chapter 3. Freight Classification. Strombeck.



# Operation and Maintenance

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## FOREWORD.

Operation and maintenance represent what corresponds to the manufacturing department of any industrial concern. The number of men employed and the amount of money that must be expended in this work will vary in direct proportion to the amount of transportation that is sold by the selling department, which is the Traffic department of a railroad.

The danger of an over-production of transportation by the Operating department is just as real and must be as studiously guarded against as an over-production in any manufacturing institution. Under-production is no less serious. To fortify against either over- or under-production, it is necessary that the Traffic department shall keep the Operating department informed as to traffic conditions sufficiently far in advance to enable those who are responsible for the production of transportation to meet the requirements.

**STUDENT WITH DIVISION ENGINEER.***First Period — Four Months.*

1. Methods and basis for distribution of charges as between betterments and additions, and operating.

2. Preparation of estimates; (a) for work not included in the annual budget, (b) for work to be included in the annual budget.

3. Organization Maintenance of Way forces.

During this period the student should endeavor to get information from original sources. To do this, it will be advisable to spend as much time as possible on the road with the Division Engineer or the Assistant Division Engineer.

**READING.**

Freight Terminals and Trains. Droege. Chapters 1, 3, 5, 12, 16, 17, 18, 19 and 20.

Economics of Railway Operation. Byers.

Elements of Railroad Engineering. Raymond.

Railroad Construction. Webb.

**STUDENT UNDER MASTER MECHANIC.**

*Second Period — Three Months.*

1. Shops and roundhouses; efficiency of, (a) as to plan, (b) as to location.
2. Organization of shop forces.
3. Distribution of labor.
4. Distribution and care of supplies.
5. Sources of expensive shop operations.
6. Shop efficiency systems.
7. Importance of the accurate checking of issues of supplies other than water and fuel.
8. Careful study of the air brake.
9. Engine failures, causes and remedies.
10. Reports, statistics and accounts.
11. Tonnage rating.
12. Effect of grades and curves on engine mileage and application of these factors to local tonnage ratings.

**SPECIAL NOTES.**

1. The student should seize every opportunity to go out on the line with the Road Foreman of Engines for the purpose of studying conditions affecting motive power.
2. Theoretical tonnage rating should not be applied independently of actual working conditions. Motive power cannot be handled on paper.
3. The student must pass the regular examination provided for firemen who are candidates for road service, before he will be permitted to leave this period.

**READING.**

Review of reading assigned for Fourth Period of General Course.

The Principles of Scientific Management. Taylor.

Freight Terminals and Trains. Droege. Chapters 27, 28, 29 and 30.

**STUDENT IN SIGNAL ENGINEER'S OFFICE.**

*Third Period — Two Months.*

**BLOCK SIGNALING.**

1. Manual block signals, staff system, telegraph system permissive, absolute.
2. Automatic block signals.
3. Interlocking plants, mechanical, electro-pneumatic, hydro-pneumatic, all air, all electric.
4. On single track; on double track.
5. Protection of crossings.
6. Mechanism, maintenance, installation.
7. Cost of maintenance, accounts and records.

**READING.**

Elements of Railroad Engineering. Raymond. Chapter 10.

Railroad Construction. Webb. Chapter 14.

The Block System. Adams.

Railway Organization and Working. Dewsnup. Pages 160-211.

Standard Book of Rules.

For definitions and illustrations, see Signal Dictionary, 1908 edition.

**STUDENT IN STORES DEPARTMENT.***Fourth Period — Two Months.*

1. Careful study of uses, value and proper care of Company material. This information to be gained as helper to Section Storekeeper in General Store.

2. Handling of requisitions; necessary approvals; from what data prepared; method by which stock is made available quickly.

3. Pricing; distribution of charges to various accounts; analysis and purpose of statements in connection with Stores Department.

**SPECIAL NOTE.**

Special attention to be given to the manner in which material is assembled and distributed during emergencies.

Carefully note total amount of stock and material carried and its effect on economical operation. How it can best be reduced to minimum and fill orders promptly.

**READING.**

Railway Organization and Working. Dewsnap. Pages 141-159.

Elements of Railroad Engineering. Raymond. Pages 1-16.

Economics of Railroad Construction. Webb. Chapters 1 to 5, inclusive.

Economics of Railway Operation. Byers. Chapter 6, Part 5.

The Supply Department. Pearce.

**STUDENT IN GENERAL MANAGER'S OFFICE.***Fifth Period—Two Months.*

The purpose of this period is to put the student in touch with organization as a whole. It is impossible for a general manager, as a rule, to come into personal contact with the multitudinous activities of a railroad. He must perforce depend to a great extent on reports from subordinate officers, and from the Accounting department. Reports from subordinate officers are usually comparatively simple to understand. The same is not always true of operating reports compiled by the Accounting department. These require careful analysis. Their chief value lies in reflecting poorly, or well, balanced relations between the operations of the several departments.

In addition to the interpretation of statistical statements, the student will be afforded an excellent opportunity to get a general knowledge of the entire organization of the Operating department, and should inform himself thoroughly as to the organization of his own road and make comparisons with the organizations of other roads.

It is the general manager who is responsible for the greater proportion of the expenditures. Hence, it is the Operating department of the service that must bear the brunt of a retrenchment order. It is, therefore, important that the Operating department be so organized that it may be quickly expanded or quickly contracted, to meet the fluctuations of business.

The business of the Operating department is to manufacture transportation; the business of the Traffic department is to sell transportation. These two functions must be evenly balanced, otherwise it is manifest that there must be waste.

**READING.**

Railroad Administration. Morris.

Modern Organization. Hine.

The American Transportation Question. Dunn.

Railroad Traffic and Rates. Johnson and Huebner. Vol. II, Pages 365-398.

Government Regulation of Railway Corporations. Johnson, in Railway Age Gazette, Feb. 11, 1910, Vol. 43, Page 306.

Freight Terminals and Trains. Droege. Chapter 8.



**STUDENT WITH TRAINMASTER.**

*Sixth Period — Five Months.*

**A. WITH YARDMASTER.**

1. Make-up of yard; purposes and uses of several groups of tracks.
2. Switching.
3. Weighing.
4. Make-up of trains: First, as to safety; second, as to destination; third, as to contents.
5. Necessity for care in handling cars.
6. Causes of unnecessary switching, and how avoided.
7. Loading of engines to full tonnage rating.
8. Special attention to methods of clearing blockades.
9. Yardmaster's records.
10. Yard expenses per freight car handled; how affected.

**B. WITH DISPATCHER.**

1. Systems of dispatching: Double order, "19" order, and staff system, and relative merits of each.
2. Different forms of train orders and their uses.
3. Handling trains, importance of economy of time in making meets.
4. Importance of familiarity with length of sidings, grades, etc.
5. Knowledge of capacity of engines. Effect of train resistance.
6. Chief causes of delays, and various methods of overcoming same.
7. Work on time-table charts.

8. Balancing of traffic.
9. Dispatcher's records and reports.

**C. WITH TRAINMASTER.**

1. Expedition of car movements, and distribution.
2. Handling of fast and slow freight, with reference to necessity and competition.
3. Full loading of cars and engines.
4. Education of station agents in the matter of full loading of cars, prevention of delays, maintenance of neat yards and stations.
5. Cutting down over-time; how best accomplished.
6. Balancing of way-work between crews.
7. Investigation of delays.
8. Enforcing operating rules.
9. Wrecking work.
10. Carrying out of the Division's policy.
11. Disciplining of employees.

**ALLOTMENT OF TIME.**

- To subdivision A, 1 month.  
To subdivision B, 1 month.  
To subdivision C, 3 months.

**SPECIAL NOTES.**

1. Keep posted as to actions taken by officials in cases of emergency, accidents and the like. There is nothing more important than quick and considerate action in cases of emergency; the proper care of passengers in accidents. The public will not be charitable towards your shortcomings, and it will many times occur that upon

a single act of yours, at the time of an accident, the entire management of the road will be praised or condemned. Earn and keep the good will of the public by giving every assistance you can consistently.

2. Special attention should be given at all times to the diplomatic handling of men. Men will have all sorts of grievances, real and imaginary, and it makes no difference how thorough a knowledge you may have of a subject, unless you are able to maintain pleasant relations with the men under you and still be absolutely fair and impartial, you are a failure.

3. After the completion of this period the student will be placed wherever it may appear necessary, in the judgment of the management, to give him further instruction in order to prepare him for promotion to a permanent position.

#### **READING.**

Standard Book of Rules, in its entirety.

All wage schedules and agreements between company and employees.

Freight Terminals and Trains. Droege. Chapters 6, 7, 13, 14, 22, 23, 24, 25 and 26.

Elements of Railroad Engineering. Raymond. All portions relative to economics of railroad operation not previously assigned.

Economics of Railroad Construction. Webb. All portions relative to economics of railroad operation not previously assigned.

Economics of Railway Operation. Byers. All portions not previously assigned.

Railway Organization and Working. Dewsnap. All portions not previously assigned.

American Railway Transportation. Johnson. All portions not previously assigned.

Letters of an Old Railroad Official to His Son, a Division Superintendent. First and Second Series. Hine.

# Traffic Department

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## FOREWORD.

The Traffic department of a railroad has one function that supersedes all others. It is the selling of transportation. It is in this department that personality is of the greatest importance. The attitude of the seller toward the buyer is a subject that is deserving of special attention. Therefore, it behooves the ambitious traffic man to study the question of personality as it is related to salesmanship.

The multiplicity of elements that go to make up personality are almost numberless. But there are certain basic principles from which they all spring, and which can be readily recognized. In the main, personality is the resultant of emotions plus thought processes.

The greater influence, by far, in the make-up of personality is the emotions. Emotions again resolve themselves into even simpler elements. Indeed, it may be said that all emotions are the result of physical actions that have been superinduced by the physical stimulation of basic instincts. No less authority than the late William James of Harvard makes the assertion that we are afraid because we run, that we do not run because we are afraid.

If we follow the emotions back to the time before they were affected by thought processes, this may be

more easily seen. For example, the emotion of disgust is always accompanied by certain very definite physical manifestations. The upper lip and the muscles of the nose are contracted. This was a process that was indulged in during our early stages of development, and is indulged in to-day by many animals, for the purpose of guarding against a disagreeable odor. A man is said to assume a surly expression or a snarl. A close observation shows that in this case there is a slight raising of the left-hand corner of the upper lip, revealing what is commonly known as the "dog" tooth. In our primitive state this tooth was shown to indicate to our fellows that it would probably be very unhealthful for them to make an attack on us, and warning was given by displaying the size and strength of this tooth.

So one might go on enumerating certain elements of personality, all of which relate themselves back to the stimulation of basic instincts, and which had as their primary cause a physical irritation of some sort. Now, by adding thought processes, which are, after all, only a refinement of earlier emotional processes, in which the more pronounced physical manifestations have been subdued, we get the elements that in reality go to make up personality. Indeed, these grosser physical manifestations have only been suppressed in a measure. They are always present to greater or less extent, depending upon the sensitiveness of the individual and the intensity of the stimulation.

Every thought tends to express itself in physical action of some kind. Even such abstract concepts as

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beauty and goodness have been shown by actual experiment to have a certain definite physical reaction. The so-called mind-reader depends almost entirely upon this one fact for his success. He has trained himself to observe and interpret very slight movements of the muscles.

Therefore, to understand personality it is necessary to be able to recognize external manifestations and relate these manifestations back to the primal instincts from which they take their origin.

While the phrase "primal instincts" has been used, it is really just a figure of speech used for the purpose of making the subject more readily understandable. There is in reality only one primal instinct, that is the instinct of self-preservation. It is this instinct that governs our first act when we come into this world; it is this instinct that governs our final act as we leave it. From this one instinct springs all that makes for society's betterment, or for society's degradation.

As the child grows, this instinct divides into four fundamental branches, which for convenience will be referred to as basic instincts. First, there grows out of it the recreative instinct—the play instinct—which causes the child to do such things as will develop him so that he may the better preserve himself in the struggle he must make later. Then comes the instinct of fear, or the religious instinct. Next comes the gregarious instinct—the herding instinct—which causes us to come together as members of society. And last the reproductive—the mating instinct—which is the ef-

fort to perpetuate the individual through the perpetuation of the race.

All things that move men to action, all institutions that live and become successful, relate themselves, in some way, to one of these four basic instincts. Every act of man takes its root in one or more of these instincts.

If we would be successful interpreters of personality, we must be able to trace the physical manifestations of the individual back to these primal, underlying forces. If we would ourselves develop a personality that will stand out attractively, we must give vent and play to these several instincts in such proportions as will give balance, in order that we may be able to see things in their proper relations to each other.

The difference between the criminal and the non-criminal is simply a difference of the sense of proportion. We call that man a criminal who takes a disproportionate view of his relation to the rest of society; and we call that man a statesman who is able to see disproportionate relations, and who makes an effort to correct them.

Every man carries the index of his personality with him, showing so plainly that he who runs may read, if we will but take the time and trouble to make the observation. Every act, every word, every physical movement spells out a man's character, and even a laugh is but an effort to cover a half naked soul. "It is the ravellings, now and then, that tell of the weave of men."

It is safe to assert that nine men out of every ten



will tell the history of their lives in the first twenty minutes of their conversation. The tendency to talk about one's self is well known. It is a perfectly natural one, and most men talk best when they are talking about themselves. This is as it should be, because we know more about ourselves than we do about anyone else or anything else. Relate this tendency back and it is seen that it goes clear back to that primal, all-governing instinct of self-preservation. Each wants the other fellow to know that he is a person of parts. But if the truth were known, when we talk about ourselves, we more often talk of ourselves as we wish we might be. We talk of the things that we wish we had done and which we know would have made us immediately recognizable as a person of importance, rather than the things that we actually did. The things we actually did are only the thread on which we weave the tale.

Recall to yourself, as you have repeated a conversation that you have had with some other person while in the heat of anger. The conversation runs about like this: "He said so and so, then I said so and so" and the answer you gave was very superior and so absolutely squelching that the other fellow was left speechless. The things that you say you said are usually the things that you wish you had said; what you actually said is often quite different.

From this it may be seen that it is easier to tell from a man's conversation what he hopes to be than what he actually is. But his actions always tell what he is. A man acts as he believes. He can't help it.

One can't believe one thing and do another. One always does the thing that he believes is best for himself personally, or best for the race.

How all this relates to the subject of salesmanship this tale may reveal. Not long since, a man who had been advertising manager for one of the largest retail stores in the United States discovered that his people had gotten overstocked with a lot of cheap pianos. He was at his wit's end to dispose of them. He had written every sort of an advertisement that he could conjure up, but the pianos would not sell. One day an old lady came into the store. She was bowed with years, her hands were knotted and horny, her shoulders were bent with toil. When asked what she wanted, she said she wanted to buy a piano. The advertising manager became interested and listened to the conversation between her and the salesman. In the course of the bargaining, she told something of the history of her life. She and her husband had come from Ireland many years ago. He was a hodcarrier and she took in washing. They had one daughter, Nellie. By dint of hard work and saving they had put by a tidy little sum, "And now," she said, "we are going to buy a piano, so Nellie can be a lady." The secret was out. The toil, the tears, the struggle, the self-denial of the life-time of two people had been for just one thing—to make Nellie a lady. The controlling passion, the absorbing ambition of every normal mother is that her daughter, her child, may be better equipped to enter life's struggle than she was. The instinct to preserve the race is dominant in every normal person.

The advertising manager had seen the light of a great idea. He went back to his office and wrote this "ad": "Make Nellie a lady by buying her a piano." That was all there was to the "ad," but the pianos sold faster than deliveries could be made. That advertisement touched a basic instinct and created a desire on the part of the mother to make Nellie a lady.

Advertising that does not ground itself on one of the fundamental instincts of mankind is money wasted; and salesmanship that does not base its operations upon these same fundamental instincts is a waste of breath and shoe leather.

Now, the instincts that dominate a man's life take expression through the things he does, through the business in which he is engaged. Therefore, if a man would be a successful salesman, he must realize that the key that will unlock the avenues of approach to a man's basic instincts is the interpretation of actions. He must learn to judge a man in terms of the man's own standards of measurement rather than in terms of his own or foreign standards. To make this thought clearer, a savage should not be judged by the standards of civilized society. He has the same right to be judged by his peers as we have. It is a gross injustice to measure the savage's moral rectitude or obliquity by any other standards than those of his own people.

The avenues of approach to an understanding of a man's character are through the business in which he is engaged. We must learn the things that prompt men to action and the only way to do this is to study their

actions. It is through the details connected with his business that a man expresses much of his personality. So true is this, that men in one class of business soon come to take on facial characteristics that are common to men in that kind of business. But the motive power that inspires action may be sometimes one thing and sometimes another. It may be social aspirations, it may be religious fervor, it may be a desire to protect his family. Whatever it may be, it will find expression through the thing a man does.

Therefore, to be a successful salesman means that he who has anything to sell must first learn to interpret the personality of the man to whom he is going to sell; find out what his customer's ambition is and, then, show him that the article he has to sell lends itself to a fuller expression of that particular ambition.

In doing this the salesman must not submerge his own personality by speaking of the commodity offered as if it were something that he were ashamed of, or by leaving the impression that the work in which he is engaged is simply a makeshift until he can get something better.

Nothing is more debilitating, both mentally and physically, than the habit of decrying your own work or the institution for which you work. There should always be criticism of one's work, but it should be constructive criticism. The men who count, the men who go to the front, are the fellows who tell how to do things, and are not content with fault-finding.

There are two types of men in the railroad business that should be banished from the face of the earth. One is the man who, by his conversation, would lead you to believe that railroad management is a maelstrom of business degeneracy. The other is the fellow who is worked to death, who is too busy to do anything except talk about how busy he is. It is these two types who will tell you at a great length what is the matter with business and how it is that they have not been advanced. Being busy is largely a state of mind rather than a condition of fact, in the railroad business. It occurs when processes are substituted for things.

One cannot be a successful salesman if he doesn't believe in what he is doing, because unbelief is written on one's face in language unmistakable. And the first word to a prospective customer reveals that fact. Convince yourself first, then you will be able to convince others. "To thine ownself be true, and it must follow as the night the day, thou canst not then be false to any man." To foist upon another anything you do not believe in, is deliberate dishonesty.

Herein lies the essential difference between a salesman and a solicitor. One is trying to sell something because he believes that it is something the customer needs and should have; the other is asking the customer to buy something just because he is put to the necessity of making a living. A salesman has buoyancy, brilliancy and assurance born of the conviction that he knows and knows that he knows. The solicitor has the hangdog expression of a beggar who knows that he knows not.

Both the term solicitor and the type of man usually designated by that title should be abolished from the railroad business.

The average solicitor does not know enough about the conditions surrounding the manufacture, fabrication or distribution of the merchandise that is handled by the firm he solicits. The number of the business-getting reasons why his road, in preference to some other, should be patronized, are pitifully few.

As illustrative of this fact the replies to questions put to a solicitor of transportation are instructive.

He was asked, "How would you proceed to get the business of a shipper?" "Well," he said, "I would first ask if he had any prospective shipments going over my lines." "Then what would you do?" "I would argue with him," he replied. "What arguments would you use?" He answered, "I would tell him that we make just as good time and that we would give him passing reports." "Anything else?" He said that was about all, then added, "Of course, if he wouldn't listen to argument I couldn't do anything." Any road would offer these same inducements. This solicitor's idea of the way to obtain business was to argue the matter.

And right here it may be well to say that an argument seldom gets anywhere. Don't argue, don't differ on non-essentials. Keep the thing that it is desired to accomplish to the front.

That recalls to memory the story of the man who wanted to sell a spring wagon. He brought a customer to see it and the customer immediately said, "Why, this

wagon is ready for the junk pile." "Yes," he said, "but I want to tell you something about the springs in that wagon. Those springs were made in Germany." "How much do you want for the wagon?" "Fifty dollars." "Why, man, the dashboard is gone." "Yes, but, you know those springs were made in Germany by one of the finest spring makers in the world." "Why, the tail board is gone." "Yes, but, you know, those springs were tempered by hand." "Why, the tires are loose and the spokes are about to fall out." "Yes, but, you know those springs are not made any more. I don't suppose there is another pair like them in the United States." "But the shafts are broken and the axles bent." "Yes, but, I want you just to look at those springs and see how they are put together." Here the salesman got his customer's attention on the springs and he kept it riveted there. He sold the wagon.

The successful salesman learns about the man's business and through this interprets the man's character and his personality. He seeks out the main spring of that man's ambition and then he centers on the spring. He does not try to straddle on half a dozen arguments or allow non-essentials to divert him. It may not be passing reports that appeal, it may not be time, but there are a hundred other things that his road does or has that would be of benefit to the man in his business. Safety, reliability of delivery, the influence of his road in the community, the amount of money it spends, and so on, and so on.

Above all, a salesman should be consistently honest with himself and with others. No man can succeed who tries to be all things to all men. His fate is sure to be like that of the chameleon that the darkey told about. "You know," said the old darkey, "my folks done got one of those chameleons. We done put him on red and he done turn red. Then we put him on green and he done turn green. Then we put him on plaid, and do you know that fool chameleon done bust himself all to pieces trying to make good."

It is sure destruction to promise things that you know you can't make good on. In other lines of business salesmen know how their goods are manufactured. It is regrettable that this is not so in railroading, but it is time it were so. In other lines of business salesmen use every effort to learn the details of their customer's business. For it is only through these that you can learn the personality of a man and adapt the thing that you have to sell to the needs of the man himself.



# Passenger and Freight Traffic

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## PASSING REPORT CLERK AT GATEWAY JUNCTION POINT.

*First Period — Three Months.*

### **READING.**

During this period no special reading is assigned. It is, most imperative, however, that the student become thoroughly familiar with the resources of the territory covered by the lines of his own company.

The student is put in this particular position for the sole purpose of affording him an opportunity to learn geography, what products are characteristic of different parts of the country, what commodities move into and out of the various localities, *when and how* these commodities move.

A traffic man must keep posted on crops and financial conditions all over the country. The "Monthly Summary of Commerce and Finance of the United States," issued by the Department of Commerce and Labor, is a very valuable source of information for this purpose and the student should acquire the habit of consulting it.

The crop reports compiled by your own road should be studied very carefully.

It is only by keeping well informed on such matters as these that you will be able to anticipate "commodity"

movements, and make proper provision for handling them.

At the conclusion of this period, the student will be given an examination, based upon the Official Railway Guide, covering railroads and steamship lines, to test his knowledge of "transportation" geography.

It is recommended that the student provide himself with a standard commercial geography.

**STUDENT IN PASSENGER TICKET OFFICE.**

*Second Period — Five Months.*

**A.**

1. Information Bureau.

**B.**

1. Ticket salesman, local.
2. Ticket salesman, interline.

**ALLOTMENT OF TIME.**

To subdivision A, 2 months.

To subdivision B, 3 months.

**SPECIAL NOTES.**

1. Neatness and courtesy go hand-in-hand with alertness and efficiency. There is no business in which they are of such paramount importance as in the passenger business of a railroad. The man who is engaged in this work is paid to be pleasant; it is as much a part of his duty as to make out a ticket correctly. A man is likely to work, think and act as he dresses.

2. Again, let me urge that, in every case where it is possible, the making of an inquiry or the purchase of a ticket be made a personal transaction. Make the patron feel that he is dealing with a man, on a man-to-man basis, and not with an impersonal corporation.

3. Information is frequently asked for over the telephone. It is over the telephone that one's voice is most likely to show impatience and irritation, and the temptation is strong to give curt answers. Thoughtless and cantankerous answers over the telephone have cost the

railroad many a friend. "A soft answer turneth away wrath." Too great pains cannot be taken to speak pleasantly and courteously, when talking over the telephone.

**READING.**

Railroad Traffic and Rates. Johnson and Huebner. Vol. II. (Read entire volume very carefully, re-reading such portions as are applicable as work of period progresses.)

**STUDENT SOLICITOR IN LARGE CITY.**

*Third Period — Four Months.*

**A.**

Acting as Assistant to Chief Clerk in the office of District Freight Agent.

1. Office methods.
2. Districting of territory.
3. Methods of keeping check on business of shippers.
4. Handling correspondence concerning "tips" on prospective business.
5. Relations with representatives of other lines.

**B.**

Collecting data from shippers requested by the Traffic department.

**C.**

Solicitor in a regularly assigned district.

**ALLOTMENT OF TIME.**

Subdivision A, 1 month.

Subdivision B, 1 month.

Subdivision C, 2 months.

**SPECIAL NOTES.**

Pride and confidence in the thing one sells is a sure road to success. It is a fundamental error to overlook small details. Courtesy, personal appearance, accuracy of statement, pleasantness of address, and, above all, sincerity, are the things that make for good salesmanship.

A thorough-going knowledge of the business in all its details lends a facility in the selling of transportation that can be gained in no other way. It is important that one should know about his competitors and their activities, but it is more important that he should avoid disparagement of his competitors. To belittle, ridicule, or underestimate a competitor is folly, and only tends to weaken one's own position.

The student should re-read at this time the foreword to the special course in Traffic.

**READING.**

Railway Transportation. Raper.

Railroad Traffic and Rates. Johnson and Huebner. Vol.

II. (Read entire volume very carefully, re-reading such portions as are applicable as work of period progresses.)

**STUDENT DISTRICT FREIGHT AND PASSENGER  
AGENT.**

*Fourth Period—Six Months.*

**A.**

General office work and records.

Special attention should be given to the handling of correspondence. The writing of letters should be given diligent study. Directness, brevity, courtesy, and clearness are the essentials of good letter writing.

**B.**

Assistant Freight and Passenger Agent.

The work of this subdivision is not enumerated, but should be done under the direction of the District Freight and Passenger Agent; and should be of such a character as usually devolves upon an Assistant Freight and Passenger Agent.

**SPECIAL NOTES.**

1. Remember always that you are a public servant. The public will not be charitable toward your shortcomings, and it will many times happen that on a single act of yours the entire management of the road will be either praised or condemned. Earn and keep the good will of the public by the efficiency of the service rendered.

2. The men under your supervision as well as patrons will have all sorts of grievances, real and imaginary, and it makes no difference how thorough a knowledge you may have of traffic matters, unless you are diplomatic and are able to maintain pleasant relations with the Com-

pany's patrons, and make the men under you feel that they will be treated with absolute fairness and impartiality, you are a failure.

3. After the completion of this period, the student will be placed wherever it may appear necessary, in the judgment of the management, to give him further instruction in order to prepare him for promotion to a permanent position.

**READING.**

Rate Making in Practice. W. Z. Ripley.

Railroad Freight Rates. McPherson.

Railway Freight Rate Making. Dunn. Railway Age Gazette, August 6, 1909; Vol. 47, Page 226.

How the States Make Interstate Rates. R. Mather. Annals of American Academy of Political and Social Science, July, 1908; Vol. 32, Page 102.

American Railway Transportation. E. R. Johnson. Chapters 10, 19 and 20.

Elements of Transportation. E. R. Johnson.



# Accounting

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## FOREWORD.

Accounting should never be an end in itself. Its proper and most efficient sphere is as a means to an end. It should be an integral and working unit in the machinery for producing transportation. There has grown up a feeling that in Auditors, as they are mis-called, inheres a greater degree of honesty than in other employes. The result has been that there has developed a defensive attitude on the part of that great body of men outside of the Accounting department. The author feels that this fact should be constantly kept in mind by the student in railroad accounting, for it is evident that the effectiveness of an accounting department as an aid to conducting the business of transportation will always be in inverse ratio to the extent to which this attitude exists.

The chief and most important function of accounting is a historical one—the recording of operations and transactions. The principal value of such data is as an aid to constructive criticism. You will note that the word “aid” is used. In and of themselves, accounting data, apart from immediate supervision, are useless. Supervision, in order to be effective, must be at close

range. So accounting should never be remote, but should go *pari passu* with the actual work that is being done. Otherwise the statistics are stale. Stale statistics are about as trustworthy for a railroad man as a block signal that gives a false indication.

**STUDENT WITH AUDITOR OF FREIGHT ACCOUNTS.**

*First Period—Three Months.*

**A.**

1. Abstract Bureau; agents' accounts.
2. Hollerith Machine Bureau.
3. Revising Bureau.
4. Interline Accounts Bureau.

**B.**

1. Statistical Bureau.

**ALLOTMENT OF TIME.**

To subdivision A, 2 months.

To subdivision B, 1 month.

**READING.**

The Railway Auditor. H. C. Whitehead.

Accounting of Merchandise Freight Receipts. J. Justice.

Modern Accounting. H. R. Hatfield.

Accounting and Auditing. W. M. Cole.

**STUDENT WITH AUDITOR OF PASSENGER ACCOUNTS.***Second Period — Three Months.*

1. Local Bureau.
2. Conductors' Bureau.
3. Statistical Bureau.
4. Miscellaneous Bureau.
5. Home Interline Bureau.
6. Foreign Interline Bureau.

**READING.**

The Working of The Railroads. L. G. McPherson,  
Chapter 4.

American Methods of Railway Accounting. Reprint  
from the Journal of the Royal Historical Society, Vol.  
71, part 4, Dec. 31, 1908, by S. Chapman.

**STUDENT IN DIVISION ACCOUNTS BUREAU AT  
DIVISION HEADQUARTERS.**

**(Passing through the Several Sub-bureaus.)**

*Third Period — Six Months.*

1. Classification of accounts as prescribed by the Interstate Commerce Commission.
2. Accounting Department, Harriman Lines, Circular No. 25.
3. Labor and materials distributions.
4. Preparation of department invoices, department bills, bills collectible, and vouchers.
5. Abstract of debits and credits to operating expenses, including preparation of Form 4904, Division Report to Accounting Department of Operating Expenses.
6. Register of debits and credits to Operating Expenses and other accounts. Including preparation of Monthly Account Current and statements to accompany same.

**SPECIAL NOTE.**

The Division Accounts Bureau represents, as far as such accounts are concerned as originate under the jurisdiction of the division superintendent, the Accounting department in miniature. It is an effort to decentralize accounting to the end that the superintendent may have immediate access to all figures affecting the operation of his division. The work is still experimental, and for this reason the student is urged to give it special attention.

**READING.**

Interstate Commerce Commission, Classification of Operating Revenues.

A Treatise on the Law of Carriers. D. C. Moore.

**STUDENT WITH AUDITOR OF DISBURSEMENTS.***Fourth Period — Three Months.***A.**

## 1. Voucher Bureau:

- (a) Examining vouchers as to distribution to accounts.
- (b) Registration of vouchers and department bills.

## 2. Motive Power Bureau:

- (a) Distribution of cost of locomotive repairs.
- (b) Distribution of cost of fuel for locomotives.
- (c) Examination of preparation of statistics of freight and passenger trains.

**B.**

## 1. Appropriation Bureau:

Preparation of records and exhibits in connection with charges to Additions and Betterments and Construction Accounts.

## 2. Statistical and Special Accounts Bureau:

- (a) Preparation of statistical exhibits.
- (b) Checking balances with Division Accounting Bureaus.

**ALLOTMENT OF TIME.**

To subdivision A, 6 weeks.

To subdivision B, 6 weeks.

**READING.**

Current Reports and Rulings of Interstate Commerce Commission affecting accounting.

**STUDENT WITH AUDITOR OF EQUIPMENT ACCOUNTS,  
MISCELLANEOUS ACCOUNTS AND GENERAL  
REVIEW OF STATISTICAL WORK.**

*Fifth Period — Three Months.*

**A.**

1. Auditor Equipment Accounts:
  - (a) Motive Power Bureau.
  - (b) Tonnage Bureau.
  - (c) Statistical Bureau.
  - (d) Per Diem Bureau.

**B.**

1. Auditor Miscellaneous Accounts:
  - (a) Station accounts.
  - (b) General accounts.
  - (c) Dining car accounts.
  - (d) Miscellaneous.

**ALLOTMENT OF TIME.**

To subdivision A, 6 weeks.

To subdivision B, 6 weeks.

**SPECIAL NOTE.**

After the completion of this period the student will be placed wherever it may appear necessary, in the judgment of the management, to give him further instruction in order to prepare him for promotion to a permanent position.

**READING.**

A general review of the reading for periods one and two.



# General Information

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## INSTRUCTIONS TO STUDENTS.

1. The work of the several periods must be pursued in the order outlined, unless special permission has been obtained to deviate therefrom.

2. Students will provide themselves with books referred to under the head "Reading" for each period as rapidly as needed.

3. Each student must be a regular subscriber to at least one railroad publication of recognized merit, and certify to such fact in his first monthly report.

4. Students will report in writing on the first day of each month to the officer in charge of students.

This report must be a full and comprehensive review and criticism of work and reading done during the preceding month.

Students should not hesitate to criticise adversely, commend, or suggest improvements. It should be remembered, however, that destructive criticism without the recommendation of something better, is nothing more than fault-finding, and, as such, accrues not to the benefit of the writer.

5. All correspondence should be addressed to the officer in charge of students.

6. Students will give notice to the officer in charge of students and to the head of the department in which employed, one month before the completion of any period, of the date such period will be completed.

7. Students will be graded on the basis of their monthly reports and reports of them given by their superior officers. In passing on reports, grammar, phrasing and general literary structure will be taken into consideration.

8. Students will be subject at all times to the rules governing the particular work at which they are employed, and shall report to and be subject to the discipline of the officer in charge of any given department with which the student may be connected, in the same manner as other employes connected therewith.

9. Students shall be on duty during the entire working time of the month. All reading must be done outside of working hours.

10. Whenever lectures are being given by the official examiner of employes in train service, all students in the locality where such lectures are in progress must be in attendance, reporting such fact to the officer in charge of students.

#### **INSTRUCTIONS TO OFFICERS.**

1. Officers under whom students may be assigned for service will see to it that students are given opportunity to pursue the work outlined in the manner and order indicated, unless special permission has been secured by a student to do otherwise.

2. All rules governing employes engaged in work of the same kind must be enforced as to students. Any infraction of the regulations in which the discipline would result in the dismissal of the party involved shall not be deviated from in case of a student.

3. In the event of the dismissal of a student from the service, the proper ranking officer will notify the officer in charge of students, giving date of dismissal and reasons therefor.

4. Officers having proper authority will issue to students assigned under them passes good on their respective divisions, whenever the duties of the student are such as require such transportation.

5. Upon the completion of a period by a student, the head of the department, or the superintendent of the division, under whom this period was taken, will render to the officer in charge of students a confidential report, giving his personal estimate of the student as to whether or not, in his opinion, he is a man who will develop into an efficient railroad official. This estimate should be based on personal observation; when this is not possible, upon reports from subordinate officers.

6. Officers will grade students in accordance with the scheme indicated under head of "System of Grading," transmitting such grade with report required under instruction No. 5.

7. Officers must consider students, while under their jurisdiction, in all respects, as a part of their own staff of employes; and will be held responsible for the proper carrying out of the provisions of this course.

**WAGE SCHEDULE.**

Students will be paid in accordance with the following schedule:

**GENERAL COURSE — 24 MONTHS.**

1st Period,	\$75	per month.
2d	"	75 " "
3d	"	80 " "
4th	"	80 " "
5th	"	80 " "
6th	"	85 " "
7th	"	85 " "

**OPERATION AND MAINTENANCE — 18 MONTHS.**

1st Period,	\$90	per month.
2d	"	90 " "
3d	"	95 " "
4th	"	95 " "
5th	"	95 " "
6th	"	100 " "

**TRAFFIC — 18 MONTHS.**

1st Period,	\$90	per month.
2d	"	90 " "
3d	"	95 " "
4th	"	100 " "

**ACCOUNTING — 18 MONTHS.**

1st Period,	\$90	per month.
2d	"	90 " "
3d	"	95 " "
4th	"	97 " "
5th	"	100 " "

The salary of the student will be at the rate as here set forth, for the period in which he is actually engaged,

regardless of the order in which the course may be pursued.

#### **EXPENSE ACCOUNT.**

Personal expense accounts will be allowed where the duties of the student are such as ordinarily carry an expense account.

Such expense accounts must be approved by the head of the department in which the student is employed, and handled in the same manner as provided for the student payroll.

#### **PAYROLL.**

Students will be carried, as "Students," on the regular payrolls of the head of the department in which employed, and on the payroll provided for employes engaged in the same kind of service. The rate of pay is to be as provided under the head "Wage Schedule."

#### **RELIEF FROM STUDENT SALARY AND EXPENSE ACCOUNT CHARGE.**

The salary of students and their expense account allowance will not be charged to the particular department in which they may be employed. The head of the department will obtain relief from such charges by charging the same off to "Other Expenses," a subdivision of the account known as "General Expenses," as provided for by the classification of the Interstate Commerce Commission; or in such other manner as may be specifically instructed by the head of the Accounting department.

**APPOINTMENTS.**

Any single man between the ages of 21 and 30 years who is an employe of this Company is eligible to appointment to a studentship.

In the making of appointments, personal address, temperament, habits, length of service, and education will be considered.

It should be understood, however, that the appointment to a studentship does not carry with it a promise or an obligation on the part of the Company that the appointee will receive an official position upon the completion of the course. A student who has been graduated from the student class will be given preference in the filling of a vacancy, provided he is temperamentally fitted to meet the peculiar conditions of the position.

**APPLICATIONS.**

Applicants must state age, postoffice address, whether married or single, address of parents, present occupation, educational qualifications, date graduated from institutions of learning, and degrees, if any; detailed account of railroad experience; and give at least three, but not more than five, references to persons not in the employ of the Company who are in a position to give testimony as to ability and moral character.

Applicants should obtain the endorsement of their superior officers.

Applications should be addressed to the officer in charge of students.

**CREDIT ON COURSE OF STUDY FOR EXPERIENCE.**

Appointees who have had experience in railroading or technical training which, in the opinion of their superior officers, covers the work outlined for any one or more of the periods of this course of study, will be allowed credit on account of such experience and the course shortened accordingly.

**SYSTEM OF GRADING STUDENTS.**

Students will be graded as follows:

Grade 1—Between 95% and 100%. Very rare and exceptional ability.

Grade 2—Between 85% and 95%. Work, reports, application to duty, ability to learn and general effectiveness, very satisfactory.

Grade 3—Between 75% and 85%. Work, reports, application to duty, ability to learn and general effectiveness, good, but could be improved without requiring "very rare and exceptional ability."

Grade 4—75% and under.

A student receiving an average grade of 4 for any period will be dropped from the student roll.

The numbers 1, 2, 3 and 4 only will be shown in markings by officials making reports.

**RELATIONS OF THE RAILROAD TO THE PEOPLE.**

There is a branch of railroading that must be made a part of every railroad man's working equipment. It must be and always will be an important part in the management of any department of a railroad. It is that function of railroading that has to do with a railroad's public relations. The head of any department who fails to give special emphasis to this phase of his work will sooner or later find himself a storm-center of discontent and public disapprobation.

The fact is that a railroad is a public service institution, and a railroad officer is a public servant. That there can be such a thing as a privately vested interest which can be held inviolable as against the public weal is a notion that modern society has cast into the discard of untenable theories.

It is evident that an institution which derives its being entirely from the people should be entirely answerable to the people. This is as it should be. A railroad, however, while it derives its right and license to do business from the people, owes the source of its existence to private parties. It thus stands in a dual relation, responsible to private owners on the one hand and to the public on the other. In short, a railroad is nothing more than a concession turned over by the people to private parties to be operated for private gain. What is true of a railroad in this respect is equally true of any corporation of monopolistic character.

"It is often said that the reason why it is right and expedient for the public to regulate railroads is that they



are quasi-public corporations; that they exercise the power of eminent domain, and render a public service. But this explanation is purely juridical. It merely tells why the government legally can regulate railroads—not why it should and does. That it can do so is no reason at all why it should do so. The only sound reason why it should do so is that public welfare requires it; and the public welfare requires it, not because the railway exercises power of eminent domain, not because it is engaged in a public service, but because it is monopolistic in its nature and has a relation to industry and commerce that enables it, if improperly managed, to do measureless evil.” \*

Such being the case, regulation is an inevitable part of corporate existence, and, as the people cannot grant to private individuals the right to do anything that would be contrary to public policy (a fact which it does not seem necessary to prove here), it is plain that the granting of a public concession carries with it the obligation to regulate such concession to the end that its activities, or lack of activities, shall not be in conflict with the public good. But, as already indicated, the right to do a thing does not by any means carry with it the necessity to exercise that right unrestrainedly. To exercise a power just because one has it, may not at all times be good public policy. The government has the power of taxation, which may be used without limitation, but so to use it certainly would be an injudicious exercise of a sovereign power.

\* The American Transportation Question, by S. O. Dunn.

Law is an insurance against trespass, and it is necessary to invoke it only when trespass is committed. Our laws, of the present day, have grown into the assumption that we are free moral agents. But we are free only within the limits we ourselves have defined by law. It is assumed by the constitution that we have the inalienable right to life, liberty and the pursuit of happiness—an assumption that is only relatively true. Freedom, in its broadest interpretation, is the right to do anything one may be able to do so long as what one does does not limit the right and ability of another to do. The economic phrasing, and latterly, the legal phrasing of this same statement is “The greatest good to the greatest number.”

It is to accomplish this end that laws are enacted; that commissions are created, and the popular conception of their purpose is that they are restrictive. With this statement of the purpose of laws and regulating bodies, we are more than likely to be content, a fact that is extremely unfortunate, for it is only a half truth. The purpose is restrictive, but it is only so for the broader and bigger purpose of preserving and guaranteeing a larger degree of freedom to the individual.

Therefore, it must be apparent that the most useful function of a regulative body is to preserve to institutions and individuals, which it may be created to regulate, the greatest measure of self-government consistent with the public welfare.

This leads to a consideration of the limitations of regulation by the various commissions which have been

established for this purpose. That is, how extensively should they exercise those powers conferred on them by statutory provisions? But this question cannot be considered adequately, apart from the economic question of the relative desirability of monopoly or competition, for, in the regulation of industrial institutions, the method and extent to which regulation is applied will depend upon the extent to which monopoly, or competition, is encouraged or discouraged.

The final end of absolute monopoly is single control and the entire elimination of competition. This is a statement that is self-evident. It is also self-evident that the only condition under which an absolute monopoly could exist would be government ownership. The inevitable tendency of monopoly is toward government ownership, public management—the goal of ultra socialists.

The final end of unrestricted competition is unrestrained individualism, where each would go his own sweet way, where co-operative endeavor would have no sanction of the law; in fact, where each would be a law unto himself—the goal of the anarchist.

Neither of these states appears desirable, at least, not to the great mass of the people of this country. The final end of either monopoly unrestrained, or competition unrestrained, is undesirable. But as the business of the country must be carried on, and, inasmuch as there remains no third alternative, it therefore follows that the ends of both monopoly and competition are desirable to a limited degree. So do we find ourselves at last com-

pelled to agree, with Aristotle, that virtue is a mean between two undesirable extremes.

It is also clear that the point at which either monopoly, or competition, should be restrained, or regulated, is at that point where it commences to impinge upon the well-being of the people or jeopardize the principle of "the greatest good to the greatest number." But as monopoly and competition are counter-irritants, as it were, they may be used effectually to check each other. Thus do we find ready to hand a natural economic power that may be invoked for the purposes of regulation.

It is a trite saying that that people is governed best which is governed least. It is a saying deeply rooted in the fundamental laws of society and economics. The whole intent and purpose of law is not to maintain a fixed status but to preserve a relation. What is true of the law is true of commissions, whose duties should be not so much the enforcement of specific laws as the preservation of proper relations between corporations and the people.

It is a mistaken notion that the enactment into statute of laws having to do with details of management increase beneficially the powers of a commission. The truth is that whenever a law is enacted, or a rule is promulgated by a commission, affecting a detail of management, inelasticity is produced, because it affects one side of a relation only.

Indeed, the functions of a commission should never be managerial, but should be judicial and corrective. A commission should only interpose for the purpose of preserv-

ing the rights of the people, and should not interpose until it is demonstrated that the rights of the people have been infringed upon, or that they are in jeopardy. It is axiomatic that it cannot be assumed that the law will be transgressed. To promulgate rules governing the details of a business, is the exercise of a judgment that presupposes that thereby the rights of the people will be better conserved, when such an assumption can have no basis in fact.

The effort on the part of regulative bodies to circumscribe and clutter their work by effecting the passage of laws that increase their power to participate in management instead of sticking to the broad principles of law and of economics has been altogether too pronounced. If a public utility commission has one excuse for existence that tops all others, it is to stimulate efficiency on the part of public service institutions. Efficiency, however, cannot be produced by simple mandates. Nothing is more destructive of efficiency than the feeling that original work is useless because it may not meet with the approval of the commissioners. Managers are afraid to undertake new things for the sake of outstripping a rival for fear it may be made a fixed practice by the Commission. These are practical results that follow from commissions concerning themselves with managerial matters. I can see no reason why the principle that obtains as to the administration of the law governing the conduct of persons in private life should not control the regulation of corporations by commissions. The law says in effect that we must not expose ourselves in-

decently, but if the police in the enforcement of this law attempted to dictate the cut of coat or the style of tie that should be worn and if they had the power to enforce their mandates, would soon banish initiative and cast a gloom over the youth of the land.

Commissions, by busying themselves with the details of management, are losing sight of the greater ends to be attained for the people, and are permitting to lie idle those two great economic instruments for the production of efficiency—Monopoly and Competition.

Public regulation of private property, I believe, will succeed if such regulation is so conducted that the greatest amount of freedom, consistent with a preservation of the interest of the public, is allowed. But where commissions attempt to regulate, in detail, as to matters which are primarily managerial, and which may, or may not, affect the public weal adversely, it is tantamount to public management of private property. This leads to just one thing—public ownership. Furthermore, it tends to divide responsibility, and begets struggle between the officers of the public on the one hand and the officers of private property on the other—a condition that is inconsistent with efficiency.

The people best fitted to run a railroad are those who have had experience in railroad matters. It is perfectly natural that railroad men should feel resentful toward commissioners who interject themselves into the management of railroad affairs. It is not sound business for men to attempt to dictate as to details of management, when by virtue of the very method of their selec-

tion, they are precluded from the possibility of knowing the ultimate effect their orders may have upon the success or failure of the institution they are attempting to control. Under the present scheme for the organization of our commissions they have the power to exercise authority without concomitant responsibility. Under the present plan, the details of management are, in a great many instances, covered by specific laws, thus precluding the use on the part of the commission of that great principle of regulation—the maintenance of a balance between monopoly and competition.

In conclusion, I should say that the limits of the regulative power of a commission should be to protect the public against the infringement of their rights; extortions and the like; that they should be governed by the larger and broader principles of law rather than by statutes governing details. It should be assumed that corporations will act consistently with the law and to the advantage of the public weal until the contrary has been shown to be the case. All matters of management should be left entirely in the hands of those best qualified to perform that work—namely, the men who are the officers of the corporation.

Numerous abuses still exist in railroad affairs, but never before in the history of this country has railroad service merited so much public approval as now. The low rates of transportation in this country today can by no means be credited to the operation of railroad commissions, but entirely to the law of competition.

It must be remembered, as Judge Prouty has pointed out, that while we can legislate as to methods in which a railroad must conduct its business we cannot, by that same process, force capital into railroad investment. It is only by allowing these institutions to work out their own salvation to their own advantage, provided only that they shall not infringe upon the rights of the people, allowing them the rewards of their service and their efforts, that we shall be able to increase the transportation facilities of this country.

After all, it is doubtless true that regulation is here to stay. What has been said before on this subject has been with the intention of defining, if possible, the limits of monopoly, of competition, and what should be the proper sphere of activity for a regulative body. There still remains to be considered the question of what is the proper and most judicious attitude for the railroad official to assume toward the several regulative bodies representing the federal, state and municipal authorities.

This much, at least, may be said: the defensive, hostile attitude toward these bodies should be laid aside; and honest, frank dealing should be the order. Subterfuge and equivocation are bound to react as boomerangs. It is the author's firm conviction, after a number of years of very close observation, that the great majority of the causes that give rise to strained relations between the people and the railroads would be absolutely wiped out of existence if railroad men would only lift the veil of secrecy and transact their business under the light of day, in the open, where all might see and understand.



It is the thing that is half concealed that piques curiosity. Speculation is always the forerunner of gossip. Garbled news leaks out to the public through employes and the newspapers, and creates and fixes a public opinion that is often totally erroneous and exceedingly harmful.

There are, of course, some things that are done in a railroad that should, for a short period of time, be held confidential. But these things are really so few that they should be handled under confidential cover between executives. It is safe to say that more than 99% of what is now considered confidential matter in a railroad could be given full and free publicity, much to the benefit of the railroad as well as the public. The old childish notion still prevails that to go about with an air of I-know-something-I-won't-tell gives the impression that one is transacting business of tremendous moment. Maybe it does, but it only spurs the other fellow on to assume the air I-don't-care-I-know-what-it-is, and he immediately proceeds to tell someone what he thinks it is without taking the precaution to say, "I think it is so and so," and straightway it passes for truth and the mischief is done.

The old attitude of the public be apostrophized must be relegated to the shelves of antiquity once and for all. The time is here when every employe of a railroad, be he high or low, must recognize that he is executing a public trust whenever he participates in the work of conducting the business of a common carrier. The public has a legitimate interest in everything a common carrier does and, therefore, has a right to know how its business

is being conducted, and what things, if any, it contemplates doing that may affect directly or indirectly the public welfare.

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